Access Control Lists(ACL) in Linux

What is ACL ?

Access control list (ACL) provides an additional, more flexible permission mechanism for file systems. It is designed to assist with UNIX file permissions. ACL allows you to give permissions for any user or group to any disc resource

Use of ACL :

Think of a scenario in which a particular user is not a member of group created by you but still you want to give some read or write access, how can you do it without making user a member of group, here comes in picture Access Control Lists, ACL helps us to do this trick.

Basically, ACLs are used to make a flexible permission mechanism in Linux.

setfacl and **getfacl** are used for setting up ACL and showing ACL respectively.

For example :

```
getfacl test/seinfeld.txt

Output:
# file: test/seinfeld.txt
# owner: iafzal
# group: iafzal
user::rw-
group::rw-
other::r--
```

List of commands for setting up ACL :

1) To add permission for a user

```
setfacl -m "u:user:permissions" /path/to/file
```

2) To add permissions for a group

```
setfacl -m "g:group:permissions" /path/to/file
```

3) To allow all files or directories to inherit ACL entries from the directory it is within

```
setfacl -dm "entry" /path/to/dir
```

4) To remove a specific entry

```
setfacl -x "entry" /path/to/file
```

5) To remove all entries

setfacl -b path/to/file

For example：

setfacl -m u:iafzal:rwx test/seinfeld.txt

Modifying ACL using setfacl：

To add permissions for a user (user is either the user name or ID):

setfacl -m "u:user:permissions"

To add permissions for a group (group is either the group name or ID):

setfacl -m "g:group:permissions"

To allow all files or directories to inherit ACL entries from the directory it is within:

setfacl -dm "entry"

Example：

setfacl -m u:iafzal:r-x test/seinfeld.txt

setfacl and getfacl

View ACL：

To show permissions：

getfacl filename

Observe the difference between output of **getfacl** command before and after setting up ACL permissions using **setfacl** command.

Remove ACL：

If you want to remove the set ACL permissions, use setfacl command with -b option.

For example：

remove set permissions

If you compare output of getfacl command before and after using setfacl command with -b option, you can observe that there is no particular entry for user iafzal in later output.

You can also check if there are any extra permissions set through ACL using ls command.

check set acl with ls

Observe the first command output in image, there is extra "+" sign after the permissions like **-rw-rwxr--+**, this indicates there are extra ACL permissions set which you can check by getfacl command